

# Mechanical **Aspire**

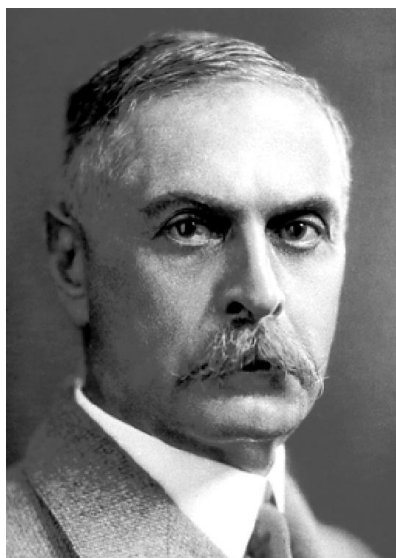
Achievements in Sports, Projects, Industry, Research and Education

## All about Nobel Prize- Part 9-Efforts to teach what is awarded

It does not stop with awarding the best contribution. Nobel prize teams have a Media wing through which all useful findings are converted into games that one can play and through this game, understand the importance of what was discovered and awarded. The most important of these games is the **Blood Typing Game**.

The Blood Typing educational game and related reading material are based on the 1930 Nobel Prize in Physiology or Medicine, which was awarded for the discovery of human blood groups in 1901. The purpose of this educational game is to learn the basics about human blood types and blood typing, as well as understanding one reason for its importance - to be able to save lives performing safe blood transfusions. Another purpose is to offer a game experience that is challenging and fun!

**Produced by:** Lina Göransson, Mirek Labedzki and Karin Svanholm at Nobel Media AB.



### **Karl Landsteiner**

**Born:** 14 June 1868, Vienna, Austrian Empire (now Austria)

**Died:** 26 June 1943, New York, NY, USA

**Affiliation at the time of the award:** Rockefeller Institute for Medical Research, New York, NY, USA

**Prize motivation:** "for his discovery of human blood groups"

**Field:** hematology

**Prize share:** 1/1



**The Blood Typing Game gives you answers to the following questions:**

- What are the different blood groups in the ABO and Rh blood group systems?
- What antibodies and antigens occur in the blood of different blood types?
- Blood typing - how do you find out to which blood type someone belongs?
- Who can receive blood from whom in a blood transfusion?
- What happens if someone is given the wrong blood in a blood transfusion?

This educational game is about human blood types, blood typing and blood transfusions. Your challenge is to save patients in urgent need of blood transfusions. Your job is to decide what blood type these patients belong to in order to administer safe blood transfusions. At the end you will be evaluated: if you make no mistakes at all you will get all five out of five blood drops. If you choose to play the Mission based game you might end up in the high score list.

Experiments with blood transfusions, the transfer of blood or blood components into a person's blood stream, have been carried out for hundreds of years. Many patients have died and it was not until 1901, when the Austrian Karl Landsteiner discovered human blood groups, that blood transfusions became safer. Mixing blood from two individuals can lead to blood clumping or agglutination. The clumped red cells can crack and cause toxic reactions. This can have fatal consequences. Karl Landsteiner discovered that blood clumping was an immunological reaction which occurs when the receiver of a blood transfusion has antibodies against the donor blood cells.

There are many other genetically determined blood group systems known today, but the ABO and Rh blood systems are the most important ones used for blood transfusions.

This educational game explores the 1930 Nobel Prize in Physiology or Medicine awarded to Karl Landsteiner for the discovery of human blood groups. Later, in 1940, Landsteiner was also part of discovering the Rh blood group system.

What happens if you get a blood transfusion with the wrong blood type? Even though a patient's own blood type is the first choice for blood transfusions, it's not always available at the blood bank. Try to save some patients' lives and learn about human blood types!

<http://www.nobelprize.org/educational/medicine/bloodtypinggame/game/index.html>

## Info to Alumni- Campus Update

Info from Dr.P.Balaji



I am glad to inform that our Alumni Mr. Ravichandran Ashwin and Ms. Anaka Alankamany are honoured with the prestigious ARJUNA AWARD 2014. It is a moment of great pride for SSN. It gives me immense pleasure to share this great news with all.

**SSN TROPHY 2014** for the 12th year was held during 26th August upto 28th August 2014. The inauguration ceremony was presided over by the Chief Guest **Shri. Kalpathi.S.Suresh**, CEO & Chairman, Kalpathi Investments and the President of the SSN Institutions **Ms. Kala Vijay Kumar**

The **Kalpathi Buchi Babhu All India Cricket Tournament** was held in our cricket ground as follows.

15.08.14 to 16.08.14 TNCA President XI Vs Assam State Cricket team

21.08.14 to 22.08.14 Uttar Pradesh State Cricket team Vs Haryana State Cricket team

30.08.14 to 31.08.14 FINAL MATCH

## Info to Alumni- Department Update

### External recognition



Dr. N. Lakshmi Narasimhan, reviewed a paper for the popular journal Int.

Communications in Heat and Mass Transfer (Elsevier Pub.)

Dr. N. Lakshmi Narasimhan, reviewed four of the technical extended abstracts submitted for the Fifth International Congress on Computational Mechanics and Simulation (ICCMS 2014) upon invitation from CSIR-SERC, Chennai.

Dr. A.K. Lakshminarayanan, Reviewed a research paper for International Journal of Materials and Manufacturing Processes, Taylor and Francis Publication

Dr. A.K. Lakshminarayanan visited Center for Material Joining and Research, Annamalai University as an External Subject Expert Member in the selection panel for recruiting a research associate for DST sponsored Project





Dr. M.S. Alphin, invited to be a advisory committee member for the national conference titled "National Conference on Energy and Manufacturing Scenario (NCEMS-15)" to be held in Kings College of Engineering, Pudukkottai on 14th Feb' 2015



Dr. B. Anand Ronald, reviewed a paper for "International Journal of Precision Engineering and Manufacturing" Publisher: Springer

## Research Publications

Dr. A.K. Lakshminarayanan's Research paper titled "Feasibility of surface-coated friction stir welding tools to join AISI 304 grade austenitic stainless steel" is accepted for publication in the Journal of Defence Technology, (Elsevier Pub)

## Conference Presentations



Dr. K.S. Vijay Sekar's paper titled "Sensitivity analysis of material constitutive model parameters in numerical simulation of the orthogonal turning process" coauthored with Dr. Pradeep Kumar M (Anna University), has been accepted for oral presentation in the International Conference on Mechanical Manufacturing and Control, ICMC 2014, Singapore, organised by IACSIT, to be held during November 21-23, 2014. SSN Management has kindly consented to sponsor the presentation

Mrs. R. Rajeswari presented a paper "Optimization of process parameters during EDM of AISI 304 stainless steel" in the International colloquium on Materials, Manufacturing and Metrology conducted by IIT Madras (8.8.2014)



## Workshops attended



Dr. S. Rajkumar, Dr. R. Prakash and Mr. D. Ebenezer attended a one day National seminar on "Energy Auditing and Conservation in Industries" on 8th August 2014, conducted by VIT University, VIT Chennai

## Training Conducted

A one day training programme on CREO 3 CAD Software was arranged by Dr. K.S. Vijay Sekar, on 11.8.2014 and attended by Dr. Nalla Mohammed and Mr. Giridharan. In the process, the CREO 2 Software was upgraded to CREO 3 for the benefit of the student community.



Dr. N. Nallusamy and Dr. S. Rajkumar were the faculty co-ordinators for a one day Energy Conservation Awareness Program conducted at Government Higher Secondary School, Nemmeli. This event was organised by M.E. Energy Engineering students and YRC of our college. (22-8-2014)

### Teachers' Day Celebrations

Mrs.R.Rajeswari, Mr.A.Balasubramanian (EEE), Mr.Thiagarajan (EEE), and Mr.R.Sivaramakrishnan (BME) won the Pattimandram event in the SSN Teacher's day celebrations cultural event held on 2-8-2014.

Dr.K.S.Vijay Sekar, Mrs.R.Rajeswari and Mr. C. Arun Prakash won the Antakshari event in the SSN Teacher's day celebrations cultural event held on 16.8.2014

Dr.K.S.Vijay Sekar, Dr.K.Babu and Dr.R.Prakash won the Quiz event in the SSN Teacher's day celebrations cultural event held on 16.8.2014



Dr.K.Babu

### Guest Lecture 1



Dr.Nalla Mohammed

on 20-8-2014, Dr.M.Nalla Mohamed and Dr.D.Ananthapadmanaban organized a guest lecture for pre-final year mechanical engineering students on the topic "Carbon Nanotubes - Basics and some recent trends" delivered by Dr.Prathap Haridoss, Professor, Metallurgy and Materials Engineering, IIT-M, Chennai



Dr.D.Anantha Padmanabhan

### Placement Support

Students who felt they are unable to express themselves, had a training session on Self Development by Student Counselor Ms.Jemima.

After the training, students felt very much enthused and confident. They have lined up for further such sessions.



Archish R, Bhargav CH, V.Kaushik and Sai Krishna K got placed in MuSigma.

Athul M, N. Priya Ragavi, V.B. Visal Kumar and Vivin Abraham Kurian got placed in Latent View Analytics



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## National Level Workshop on CMM-A Mechatronics Approach In Metrology



Dr.G.Satheesh Kumar

The department of Mechanical Engineering organized a One day National level workshop on “**CMM-A Mechatronics Approach in Metrology**” on August 28, 2014.

The event was organized by faculty members Dr. G. Satheesh Kumar and Mr. C. Arun Prakash.



Mr.C.Arun Prakash

The main objective of this workshop was to introduce the concepts of integrating interactions between Metrology and Mechatronics and to have a hands-on exposure for planning the experiments and projects, for the students, on an economical CMM relevant to Metrology lab.

About 30 participants (Faculty and Students) from various colleges across Tamil Nadu participated in this workshop.

In the first session, Prof G. L. Samuel of IIT Madras, delivered a presentation on Co-ordinate Metrology and its Application. He introduced the concepts of Mechatronics, Metrology and Co-ordinate Measuring Machine (CMM) to the audience.

In the second session, Mr. S. Viswesh, Managing Director, SVP Laser Technologies Pvt Ltd. delivered a lecture on Low cost automation, manufacturing and new product development. In the third session Dr. G. Satheesh Kumar delivered a lecture on Role of Mechatronics in Intelligent Measurements.

In the afternoon session participants were provided hands on knowledge on the new technologies related to CMM and CNC. Experts from SVP Laser Technologies Pvt Ltd. were invited to give a hands-on-session on CMM and CNC machines. The coordinators thank the department and the management for their encouragement and support. They also thank the student volunteers Vijaya Sundara Pandian, Ragunathan, Parkunan, Ramasamy, Sathish Kumar and Vivekanandan for their immense support.

### PG Students at YRC activity

ME Energy students jointly with SSN – YRC (Youth Red Cross) conducted a one day awareness programme on Energy Conservation at Govt. Hr. Sec. School, Nemmeli Village, ECR on 22.08.2014

The following events were conducted.

1. Presentation on 'Need for Energy Conservation and Renewable Energy Technologies'
2. Presentation on "Energy Conservation tips to be implemented in schools and home"
3. Practical explanation using training kits
4. Quiz





## Student Activity



Our Students conducted the SAE India student convention Competitions and sent the results to the SAE India team.



Aero Modelling



Animation

## External Events

Abeshek, Anand ,Vinay, Samuel and Tarun of Second Year mech won the Music Competition at MOP Vaishnav  
Arvind.S. and Gokul.V. participated in Mahindra Auto Quotient event at SRM University





## Exciting Internships - 1

My name is Jason Christopher Jolly, a student of Mechanical Engineering, currently in my final year. I have, over the course of the past three years, become extremely interested in the engineering fields of design and material sciences, as well as the applications of these fields to the study of bio-mechanics, bio-materials. I was eager to understand the research environment that exists in other countries and at the same time further my knowledge of materials, design procedures and mechanics.

The application process to get any opportunity to do an internship abroad is tedious and is almost comparable to a Master's program application. I was fortunate to get an offer from a professor at Imperial College, London to work on a project involving bio-materials and biomechanics.

My internship at the MSk laboratory of Imperial College has given me an insight into how a research environment, partly fuelled by surgeons and engineers alike, can foster a stimulating and intense learning experience for any individual to work in and contribute intellectually, while all the while learning and benefiting from each other's expertise in diverse fields.

Thanks to our Principal , President and Managemet who facilitate such Internships

My project involved the setting up of a low cost Digital Image Correlation (DIC) system to analyse strain distributions and displacements, which can be applied to study any bio-medical / bio-mechanical implement or specimen. The project required me to recall the concepts I had learnt in the material science subjects from my second year, the design subjects of third year as well as the fundamentals of electronics and programming. It required a lot of thinking outside the box to find the simplest solution to every problem that we encountered – something that they insisted on there at the lab; anything over-engineered was treated with the same level of contempt as a poorly-engineered solution.

The one thing in particular that struck me was the diverse skill set that every researcher there possessed and their ability to apply in one way or the other, every concept they had learnt in their various degree programs. It reinforced the ideology that I have long held in belief - that it isn't sufficient to have bookish knowledge alone and to do well in exams, but to look to apply any knowledge you get from the standard curriculum in real world

research. I was proud to tell the researchers there that I studied in a department that fosters an attitude towards research in undergraduates - something that is rarely found in Indian engineering colleges other than the IITs, the NITs etc.

Over the 6 week period, I studied the fundamentals of the relevant concepts in detail, sourced or designed + manufactured the required hardware and equipment, assembled them and finally subjected the system to a number of tests and trials. The manufacturing process was made much easier with the help of 3D printers – this made prototyping and testing, a much faster and more cost efficient process. I ran several independent experiments to ensure the system was reliable and got satisfactory correlations after I rectified/worked around any problems/eventualities that cropped up. Commercially available systems were very expensive – around 70 lakhs (Indian rupees). The system I set up was a low cost alternative that can be customised to work with any UTM.

Overall, my experience was very fulfilling and it has opened my eyes to a world of opportunity that exists nowadays to carry out result oriented cutting edge research and development to meet the real needs and requirements of individuals, organisations or any customer base for that matter.

## Exciting Internships - 2



Firstly I thank our Principal Dr. Salivahanan and President Ms.Kala Vijayakumar for having given me this opportunity to attend this summer course in Aachen, Germany.

It all started off by taking part in a competition conducted by the DAAD – “German Academic Exchange Service” for students currently enrolled in any field of study and having prerequisite knowledge of German upto the B2 level. I took part in the competition and the first round was writing an essay about a given topic in German.

I got selected to the second round where I had to send my CV and other details related to my academic background. All this happened between October 2013 and January 2014. End of April 2014 I received an email from DAAD stating that I had won the scholarship and will be awarded the scholarship for a month's stay in Germany and will be attending a course “German for Engineers”. I was elated and wanted to make use of this opportunity to search for more alternatives for my future. Having being granted permission by the Principal and HOD, I flew to Germany on the 1<sup>st</sup> of July with many more experiences ahead of me.

It was not my first time in Germany so I was able to manage and comfortably reach the destination Aachen in the westernmost part of Germany. After reaching I was given an accommodation very close to the Central Station in Aachen and the next day we took up a placement test to access the level of German each one in the course has. There were also other activities after the class hours which were informed to us on the day of arrival in Germany. Classes started off the next day and it was very interesting to learn many technical details, which I had learnt as basics at College.



We covered a wide range of topics including

1. "Automobiles" (History and Development, Electric cars, Bio fuels and alternative fuels),
- 2.Data transfer through light, Electromagnetism,
- 3.Materials(Self-healing and Self-cleaning materials, Industrial applications of Adhesives),
- 4.Renewable Energies(Water-, Wind- and Solar energy, Storage of Energy),
- 5.Records in Science,
- 6.Robotics,
- 7.Development of Software,
- 8.Supercomputers and Internet,
- 9.Training for Job Interviews.

As a part of the course there were also two field trips organized by the Institute. The first field trip was to the Jülich Research Centre and the second field trip was to the Ford research centre. Both the trips were very interesting.

The Jülich research centre used to be a centre for atomic research, but atomic research has been stopped of late as Germany is planning to phase out all of its nuclear power plants by the year 2020. They are currently carrying out research in fuel cells and solar energy. They have two huge Supercomputers in their campus.



The Ford research centre in Aachen is also involved in many projects such as ECG-Autos (These are cars fitted with ECG's to measure the driver's heart rate and based on this the car can be stopped when the driver becomes unconscious, falls asleep or gets too nervous while driving). The Ford research centre is now collaborating with many other car companies such as BMW, VW etc. to bring in car to car communication to lessen the no. of accidents taking place on roads and making it safer to drive.

It was also very good interacting with Engineers from different countries especially Mechanical Engineers. Other than me there were four others from Russia, Columbia, Turkey and Hungary who were mechanical engineers and interacting with them and experiencing different views in the same field was fascinating. The way an engineer thinks is different in almost every country, I hope this difference in thought can bring about radical changes in innovation and further development of machines and other important gadgets in daily life.

The following are the points I want to throw light on during the interactive session with my juniors:

1. My experiences in Germany (The course and how Engineers from different countries think)
2. The future of Mechanical Engineering (the present scenario) in Germany.
3. Renewable energy and its future in Germany.
4. What German Companies expect from you, when you approach them for a Job or an Internship)
5. How the interviews are in a German company and what do they expect from you during an Interview (Though I have not attended an Interview in Germany, I was given training and tips as a part of the course).

If these points may be valuable and necessary for my juniors, I would gladly like to give a presentation and have an interactive session with them

Srinath was invited to share his experiences with Fifth Sem B section students on 27-8-2014.  
Maybe, in future, we may see more students exploring this opportunity.

### Info From Alumni - 1



This is Mohammed Irfaan who visited you today in our college . I'm a 2012 passout and I worked in Rane for 2 years . Now I am leaving to Germany to do my masters in MS in Management and Production Systems Engineering at the RWTH University .

If you want any other information/help from my end ,please write to me .

### Info From Alumni - 2

Hello sir,

My respects and greetings. Hope all is fine. I have finally chosen North Carolina State University as my choice for an MS program and have enrolled with them. Classes start next week and I have already arrived here sir. Was so eager to come and thank all of you in person but formalities associated with this kept me running everywhere to get things done. And I had to take care of all formalities only after I could come to Chennai after leaving from ITC Badrachalam. Thanks for all the support sir. It was invaluable and humbling.

With best regards,  
Goutham Chandramouli



I am very happy to inform you that I am leaving to USA next week. I have got admission in University of Illinois, Chicago for MS in Industrial Engineering. I would like to take this opportunity to thank you for the great support you provided during my application process in providing recommendation letters for the universities I applied. With your blessings, I am leaving India on July 30 to continue my studies.

Thanks again.

Regards,  
Vivekanand S.R.,  
SSN Mechanical 2008-2012.

### Info From Alumni - 3



Shashank Suresh

Dear Sir,

This is with reference to the summer school program I did in the Ingolstadt University of Applied Sciences, Germany. The course consisted of several components that are critical in today's world of automotive engineering. Probably the course wasn't structured to be as difficult as I expected a course offered by a German university, but nonetheless, I did learn about a lot of new developments that are currently taking place.

### Info From Alumni - 4

The course featured advanced battery technologies in cars, followed by vehicular communication i.e. ad-hoc networks in cars. The current research focuses on using 4G technology in cars, and by 2030, it was told that we can expect fully automated grids of inter-connected vehicles. We then had a course on acoustics in cars, wherein we had to measure and analyze the vehicle noise under various operating conditions between the Ford focus and the Volkswagen golf electric. The next course was on techniques for CO2 reduction techniques and hybrid vehicles, wherein alternate propulsion systems were discussed, and the current hybrid and electric vehicles in the market were analyzed in detail. As a part of the course, we also visited the Audi, EDAG and Continental factories. Most of us were amazed at the fact that the Audi factory has more robots than human workers.

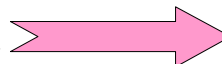
It was a very good learning curve, to live and study in Germany. The university is also doing some pretty good research, and I'd probably suggest that the juniors could apply here if they were interested. I recently read the article written by Nitin Krishnan, and agree with what he had to say about Germany. It is an extremely competitive place to study in, but a highly rewarding one in terms of knowledge. It was no understatement that the Germans love their cars; they put a lot of work into their research and development.

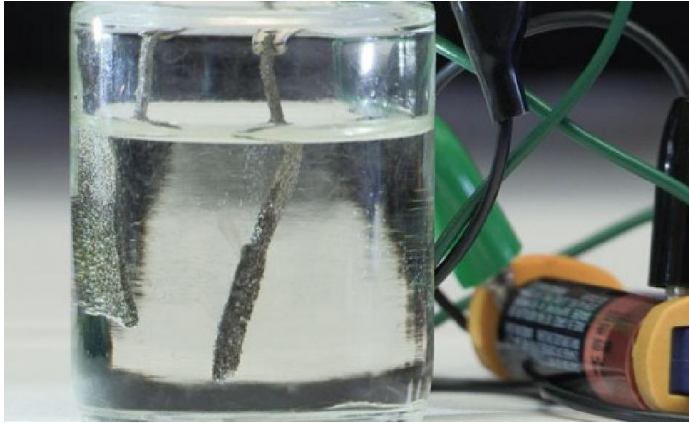
Regards,

Shashank Suresh

### Info From Alumni - 5

T.S.Maheswaran is now GET at Godrej Industries Ltd





### Scientists create water splitter that runs on a single AAA battery

A new emissions-free device created by scientists at Stanford University uses an ordinary 1.5-volt battery to split water into hydrogen and oxygen at room temperature, potentially providing a low-cost method to power fuel cells in zero-emissions vehicles and buildings.

The water splitter is made from the relatively cheap and abundant metals nickel and iron. It works by sending an electric current from a single-cell AAA battery through two electrodes.

"This is the first time anyone has used non-precious metal catalysts to split water at a voltage that low," chemistry professor and lead researcher Hongjie Dai says. "It's quite remarkable, because normally you need expensive metals like platinum or iridium to achieve that voltage."

The technology has huge potential as a source for powering hydrogen fuel cells, long held as a likely successor to gasoline. Unlike gasoline combustion, which emits large quantities of the greenhouse gas carbon dioxide, fuel cells combine stored hydrogen gas with oxygen from the air to produce electricity, leaving only water as a byproduct.

Fuel cell vehicles have been around since the 1960s, albeit mostly as research projects and demonstration cars and buses. But we may soon see them in commercial production, with [Toyota](#) and [Honda](#) both committed to selling fuel cell cars in 2015 and Hyundai already [leasing](#) fuel cell vehicles in Southern California.

Fuel cell vehicles have been widely criticized for their high cost, the lack of infrastructure around their fuel delivery, and their low energy efficiency after accounting for the effort it takes to produce compressed hydrogen (often involving large industrial plants that use an energy-intensive process that combines steam and natural gas).

But the new Stanford research, which latches onto a previously unknown method for splitting water, could help account for all these issues.

"It's been a constant pursuit for decades to make low-cost electrocatalysts with high activity and long durability," Dai explains. "When we found out that a nickel-based catalyst is as effective as platinum, it came as a complete surprise."

The nickel-metal/nickel-oxide catalyst, discovered by Stanford graduate student Ming Gong, also requires significantly lower voltages to split water when compared to pure nickel or pure nickel oxide. This new technique is not quite ready for commercial production, though.

"The electrodes are fairly stable, but they do slowly decay over time," Gong says. "The current device would probably run for days, but weeks or months would be preferable. That goal is achievable based on my most recent results."

The next step is to improve that decay rate and to test a version that runs on electricity produced by solar energy instead of the AAA battery.

The researchers believe that their water splitter could save hydrogen producers billions of dollars, and the electrolytic device could be used to make chlorine gas and sodium hydroxide as well as hydrogen fuel cells.

A [paper](#) published in the journal *Nature Communications* describes the research in more detail.

You can see Dai himself demonstrating the device in the video below.

[https://www.youtube.com/watch?feature=player\\_embedded&v=Nh\\_0cRYebYU](https://www.youtube.com/watch?feature=player_embedded&v=Nh_0cRYebYU)





### Transparent Solar Collector

Researchers working at Michigan State University (MSU) have created a completely transparent solar collector which is so clear that it could replace conventional glass in windows. The new devices – dubbed transparent luminescent solar concentrators – have the potential to not only turn windows into solar electric generators, but the screens of smartphones, vehicle glazing, and almost anything else that has a see-through surface.

Experiments with [transparent solar collectors](#) have been conducted for quite some time now, but they have resulted in variable success and many poor results – particularly around the inefficient production of energy. More to the point, most of the produced materials weren't completely transparent, rather being [brightly-colored](#) or [too darkly tinted](#).

"No one wants to sit behind colored glass," said Richard Lunt, assistant professor of chemical engineering and materials science at MSU. "It makes for a very colorful environment, like working in a disco. We take an approach where we actually make the luminescent active layer itself transparent."

Unlike standard photovoltaic solar cells that capture energy mainly from the visible part of the light spectrum, the transparent solar collectors developed by the MSU team use microscopic organic molecules designed to absorb specific wavelengths of light invisible to the human eye. To accumulate and use this solar energy, the collector channels the light to the perimeter edge of the plastic where it is transformed into electricity by thin strips of photovoltaic solar cells.

"We can tune these materials to pick up just the ultraviolet and the near infrared wavelengths that then 'glow' at another wavelength in the infrared," explained Lunt. "Because the materials do not absorb or emit light in the visible spectrum, they look exceptionally transparent to the human eye."

As previously stated, one of the proposed uses of this completely transparent material would be in its use as a solar collector in place of conventional glazing or where transparent plastics are now used. The team admits that the technology is still at an early stage in its development, but claims that it holds the prospect of being scaled-up to commercial levels for use in industrial applications and can be produced at a reasonable cost.

"It opens a lot of area to deploy solar energy in a non-intrusive way," said Lunt. "It can be used on tall buildings with lots of windows or any kind of mobile device that demands high aesthetic quality like a phone or e-reader. Ultimately we want to make solar harvesting surfaces that you do not even know are there."

The research is also at an early level of efficiency as well; despite references to the inefficiencies of colored solar collectors, the prototype MSU devices barely produce a solar conversion efficiency of 1 percent. As a result, the team aims to reach efficiencies "beyond 5 percent" at some stage, noting that the best colored solar collectors developed elsewhere have a conversion efficiency of about 7 percent.

The research recently featured in the journal [Advanced Optical Materials](#)



According to market-based research firm [IDTechEx](#), the medical and dental market for 3D-printers is set to grow from US\$141 million to \$868 million by the year 2025. And when you consider the recent spate of groundbreaking medical procedures, it is pretty easy to see why. The latest surgery brought to you by the seemingly endless possibilities of 3D-printing comes at the hands of doctors at China's Peking University Third Hospital, who produced a custom implant to replace a cancerous vertebra in the neck of a 12-year-old boy.

Minghao (a pseudonym) didn't feel much pain when he headed a soccer ball during a match with his friends. But waking up the next morning with a stiff, aching neck offered an early sign that something was not quite right. One month after the incident, Minghao's entire body went numb, leading spinal experts to perform a biopsy and ultimately diagnose him with a malignant tumor on the second vertebra in his neck.

Following two months of lying in the orthopedics ward at Peking University Third Hospital, only able to stand for a few minutes at a time, doctors commenced what would be the world's first 3D-printed vertebra surgery.

Over five hours, the doctors removed the cancerous vertebra and implanted the 3D-printed piece between his first and third vertebrae. This involved clearing the nerves, carotid arteries and spinal chord of cancerous tissue and fixing the artificial vertebra in place with titanium screws. The doctors say the 3D-printed implant was an improvement on current methods and enabled a much quicker recovery time.

"Using existing technology, the patient's head needs to be framed with pins after surgery," Liu Zhongjun, director of orthopedics at Peking University Third Hospital, told [CCTV.com](#). "The patient's head cannot touch the bed when he is resting. This lasts for at least three months. But with 3D printing technology, we can simulate the shape of the vertebra, which is much stronger and more convenient than traditional methods."

A huge advantage of 3D-printing is the ability to customize medical implants, allowing for a perfect fit with the patient's anatomy. Some recent examples include 3D-printed [spine cages](#), [skull](#) and [jaw](#) implants, along with customized [mouthpieces](#) for sleep apnea sufferers.

While he is unable to speak and uses a writing board to communicate, Minghao is said to be in good physical condition and recovering as expected.

Source: [Peking University Third Hospital](#)



### Chairless Chair – Ergonomy in Production

The Chairless Chair attaches to the user like a pair of pants to create a wearable chair that can be worn all the time. An "ergonomic leg device" developed for use in industrial settings,

The Chairless Chair promises to increase the users' health, comfort and productivity by allowing workers to take the weight off their legs and back at any time. Made of carbon fiber and aluminum, the device weighs less than five pounds and is unobtrusive enough to be worn while walking or running. It can be set into a variety of positions and then secured with a battery-operated lock, which enables the user to rest their weight without the device ever touching the floor.

The Chairless Chair was born from its co-founder's experience working in a UK packing company. According to Keith Gunura, co-founder and CEO of the startup noonee- "Standing for hours on end causes a lot of distress on the lower limbs, but most workers get very few breaks and chairs are rarely provided because they take up too much space. So I thought that the best idea was to strap an unobtrusive chair directly to myself."

If you work somewhere such as a factory, warehouse, or restaurant kitchen, then you'll know how tiring it can be to stand for several hours at a time. Unfortunately, however, it isn't always practical or safe to carry a stool around with you wherever you go. That's why Swiss start-up noonee has created the Chairless Chair. Worn as an exoskeleton on the back of the legs, it lets you walk or even run as needed, but can be locked into a supporting structure when you go into a sitting position.

Company CEO Keith Gunura started developing the Chairless Chair in 2009, when he was a student in the Bioinspired Robotics Lab at the ETH Zurich research institute. He was inspired to do so by memories of his first job, in which he worked while standing at a packaging line.

Now in prototype form and being actively marketed, the device utilizes a powered variable damper to support the wearer's body weight. The user simply bends their knees to get themselves down to the level at which they'd like to sit, and then engages the damper. The Chairless Chair then locks into that configuration, directing their weight down to the heels of their shoes, to which it is attached – it also attaches to the thighs via straps, and to the waist using a belt.

Plans call for the commercial model to weigh 2 kg (4.4 lb), and to be able to operate for at least eight hours on one charge of its 9-volt battery. There's no word on an estimated price.

"At the moment we are getting a lot of interest and e-mails from all kinds of people who want to use the Chairless Chair in very different areas: factories, film industry (photographers and camera men), medical, agricultural (harvesting and gardening), hiking, and a lot others," noonee CFO Olga Motovilova told us. "Our focus at the moment is factory environments."

More information is available in the following video.

[https://www.youtube.com/watch?feature=player\\_embedded&v=8KSUJ9Xtw9E](https://www.youtube.com/watch?feature=player_embedded&v=8KSUJ9Xtw9E)



Special Report - Dr.Shiv Nadar's Reflections  
on Independence Day Speech of Prime Minister



Our Prime Minister spoke yesterday very movingly about his vision for India over the next few years and some key actions that he wants to take to realize the vision. I heard the speech and felt that many of the actions that he is speaking of mirrors some of the key activities that we are doing at the Shiv Nadar Foundation and through HCL Foundation. He spoke about the use of technology for education, creating toilets in all schools, creating model villages and imparting skills to the youth, and we are already doing all of these at our Foundations.

One of the enduring way of developing a model village is alleviating illiteracy in villages : Our Project Shiksha, 2 years into being, is working at it in 40 schools already. We are, as a part of the program, getting toilets specially for girls, constructed. Adult Education is embedded in this Project. VidyaGyan is even bolder, getting each of these villages in every district of UP, to get its own leader, from amongst their own and amidst them. This will go wide, deep and the longest directly and through the aspiration spirals that it will create in each such village. We are currently reaching over 1500 villages already. Samudhay is the Project of HCL Foundation. This has started three years ago in the urban slums and villages and is now adding rural villages: their scope has been boldly enhanced to build and sustain 100 model villages. HCL T Board has already reviewed the project and approved , funds are in place to take up the scope addition. This is on the dot, bang on of what our Prime Minister has urged the Members of Parliament to do.

It gives me great satisfaction to see that the Prime Minister has all these important developments in mind, and that we are working on the right track with alignment of our vision and the Nation's vision. I think all of you should take pride in the fact that we are contributing to Nation Building.

Nation Building is a vast effort. Like the squirrel in Ramayan helps build the bridge to Lanka, I am glad and proud that we all are also doing our part.

Wishing you all a Happy Independence Day and a fulfilling year ahead.

Warm regards

Shiv

## Passion Parade – Pragadish on his Shooting Spree



I am happy to bring to your knowledge my achievements in the 40th Tamil Nadu State Shooting Championship 2014 held in Chennai From 6th august to 10th august .

**I took part in 3 events :- 10m air rifle , 50m prone and 50m 3position .I managed to win two gold medals and one silver medal.**

**10m Air Rifle - GOLD**

**50m 3position - GOLD**

**50m Prone - SILVER**

I had a bad season for the last two years as I could not practise on a daily basis and had to compete with shooters who practise all year round. This year I worked very hard ; I went to coimbatore(my native) every weekend to get two days of practise and with the help of my coach I was able to regain my form. This competition was a breakthrough for me and I'm very happy with the result. I will take this positive energy and continue working towards the national championship 2014 .

## 1. HOW DID YOU DEVELOP THIS PASSION?

Like any other boy I was passionate about cars and guns when I was a kid . It all started on a weekend in my uncles farmhouse back in 2008; I was on a holiday with my family . My friends and I were shooting beverage cans as targets with an air rifle . I shot around 6 cans without missing a shot out , that's when my dad realised that I have a good hand and eye co-ordination and maybe I can do well in target shooting . The following week I joined the Coimbatore rifle club and three months later I set a new record in my debut attempt (10m at rifle event) in the 2009 state championship .

## 2.HOW DID YOU NURTURE IT?

My father was my first coach. He was a good **shooter himself but couldn't pursue it like I did due to various reasons; so I had my roots in shooting by heredity .**

I practised everyday with my father and had longer sessions during weekends . He is a person who analyses my mistakes while I'm shooting and with his guidance I kept winning medals . Despite of doing well in most of the tournaments My scores went down in every selection trial and wasn't sufficient enough for me to enter into the Indian squad. Then I met Mr.Sargurudas; former top line Indian rifle shooter and explained my situation to him . He accepted my request to coach me , he taught me the crucial techniques few of which were triggering , breath control and posture . He showed me how small things like hold and follow through can make shooting much easier and better . With his guidance my scores jumped higher and were consistent . His coaching made a huge difference and helped me clinch gold medal in this year's state championship .



On the left -Gagan Naran ( world no.1 in air rifle )

On the right - P.T.Raghunath ; my then coach and Gagan's team mate

## 3. WHAT ARE YOUR ACHIEVEMENTS TILL DATE?

- a) Broke a 8yr old record in 10m air rifle event -2009 state championship
- b) Won silver in double trap event in 2011 national championship
- c) Won the renowned shot in 10m air rifle event in 2012 national championship
- d) Won two gold medal (10m air rifle and 50m prone ) and one silver medal (50m prone) in 2014 state championship

## 4.WHAT YOU INTEND TO DO IN THE FUTURE?(HOW WILL U BALANCE THIS TALENT BEING AN ENGINEER)

With my coach's guidance if I'm able to represent the county and win some medals sooner or later it would be a dream come true . Doing engineering and shooting side by side is definitely no joke . The college being away from the city and not having a shooting range makes things even more difficult .In fact the first two years of college I under performed in most of my competitions and was in the verge of quitting Rifle shooting . I Managed to hold on to it and was being diligent hoping things would turn around and it did . The ultimate goal is to represent India .Even though I will graduate as an engineer in another year I will pursue my passion and I have always believed that dreams do come true if chased hard . Shooting is an integral part of my career and it will remain so .



## Attention: Faculty- Understanding Student feedback

A feedback is like a mirror. Using what information it throws or neglecting it - is our choice. Try and make sense out of what your students are trying to tell you. When you receive your feedback from students, please look for three aspects.

### **1. Comments at the end of the sheet**

a) Any negative comment is worth understanding and analysing. Share the comment with your close associate and find out what in you would have triggered such a comment. This is what you need to **Stop doing**.

b) Check with others who got good comments or with your HoD and see what new behaviours can help remove this wrong impression. This is what you have to **Start doing**.

c) Any positive comment- understand what lead to such a good perception. This is what you have to **Continue doing**.

### **2. The average score as an indicator**

If it is less than 70%, please be alert and try to see what went wrong. While this is not reflective of your capabilities as a teacher, it is definitely an indicator of how that class has perceived you. This normally happens only when you have not completed the portions in full or your teaching style has not struck a chord with the students (you have failed to strike a relationship with students). Abusive, threatening or insulting styles do not go well with present generation, irrespective of how great you are in your subject. Kindly approach your scores in this angle.

### **3. Item wise Score analysis as an indicator**

Even if your score is good, you can find which aspects you can improve. Your feedback excel sheet has numbers (1 to 12) with scores for each item ranging from 0 to 5. What the numbers 1 -12 in the excel sheet indicate are given below.

| S.No | Aspect of Evaluation                         | S.No | Aspect of Evaluation                    |
|------|--|------|---|
| 1    | Punctuality to Class                         | 7    | Usage of Teaching Aids                  |
| 2    | Preparation for Class                        | 8    | Attention to weak students              |
| 3    | Syllabus Completion as scheduled             | 9    | Communication                           |
| 4    | Evaluation & return of answer sheets on time | 10   | Motivating Students                     |
| 5    | Illustration with multiple examples          | 11   | Making students understand subject      |
| 6    | Willingness to explain all over again        | 12   | Encouraging extra curricular activities |

You may analyse the data columnwise and find out which of these items ( columns) reduce your score and accordingly mend your ways.

### **If you are shocked at the rating which is unacceptably low**

Maybe you were very strict on certain issues- unfortunately, in present generation, even demanding a disciplined culture like coming to class on time- is considered as attack on student freedom and that might have lead to a revenge mentality- which is very rare. However, if you really feel so, then it is possible to use the following method to check your real feedback.

A person who wants to revenge, will simply mark either 1 or zero for all the items- indicating he is angry with you. You can just remove the number of persons of that nature and rework your score. For example, out of 35 students , if 7 students have marked 1 for all items, then the analysis can be reworked as below.

|  |        |
|--|--------|
| Score for each student max 5 points x 12 items   | = 60   |
| for 35 students max score                        | = 2100 |
| let us say your total score now is 1240 which is | = 59 % |



now remove 7 students who have marked 1 each for all items .

|  |                       |
|--|-----------------------|
| Total is reduced by $7 \times 12$                                  | = 84 points           |
| revised total is 1240 minus 84                                     | = 1156                |
| revised denominator is (35 minus 7 =) 28 students x 60 points each | = 1680                |
| revised score % is   | = 69 (ie 1156 / 1680) |

This can be summed up as below

| Item                 | Existing      | Revised       |
|----------------------|---------------|---------------|
| Achieved Score       | 1240          | 1156          |
| Eligible Total Score | 2100 (=35x60) | 1680 (=28x60) |
| Percentage           | 59            | 69            |
| Students considered  | 35            | 28            |

- You can see that 7 students , if angry, can pull down your otherwise good score by ten percentage points.
- If this category of marking 1 for all points is a large number of the total population, then the dip in your eligible score will be very high.
- In such a case, don't get frustrated and drop the whole idea of disciplining.
- Instead, you have to relook at the approach taken to create discipline.
- Check with your friends on what could have been done better.

While nothing can change your score and its impact on your career graph, at least you can realise what went wrong

#### Corporate Wisdom-9 – Goals and Objectives



Mr.R.Ramakrishnan,  
Advisor, GMR Group



Most of you must be in the process of setting your goals and objectives for the Performance Management Process for you and your team . I thought it is important to know something about goals and objectives.

**When you have something you want to accomplish, it is important to set both goals and objectives. But there are differences between goals and objectives and both are important . Goals without objectives can never be accomplished , while objectives without goals will never get you where you want to be. The two are separate but related and will help you to be who you want to be.**

- Goals are long terms aims that you want to accomplish whereas
- Objectives are concrete attainments that can be achieved by following a certain number of steps.
- Goals and objectives are often used by us interchangeably, but the main difference comes in their level of concreteness.
- Objectives are very concrete, whereas goals are less structured.

Goals has the word “Go” in it. Your goals should go forward in a specific direction. Goals are more about everything you accomplish on your journey, rather than getting to that distant point. Goals will go into undiscovered territory and you therefore can’t even know where the end will be.

Objectives has the word “Object” in it. Objects are concrete. They are something that you can hold in your hand. Because of this, your objectives can be clearly outlined with time lines, budgets, and needs. Every area of each objective should be firm.

Generally goals there is no set way in which to measure the accomplishments. You may feel that you are closer, but since goals are de facto nebulous, you can never say for sure that you have definitively achieved them.

Objectives can be measured. Simply phrase your objective in the form of a question.

**Goals are broad whereas objectives are narrow.**

**Goals are general intentions; Objectives are precise.**

**Goals may not be intangible; Objectives are tangible.**

**Goals are abstract; Objectives are concrete**

**Goals cannot be validated as is ; Objectives can be validated.**

### **Let me give you an example**

Goal – I want to achieve success in the field of Renewable Energy research and do what no one has done before .

Objective –I want to complete the research thesis by end of this month.

Set your goals and objectives – Both are important

Have a wonderful day !

Ramki

#### **Forthcoming Event**

International workshop on  
Renewable Energy Technologies  
At IITM during Dec 9-10, 2014  
Contact [ksreddy@iitm.ac.in](mailto:ksreddy@iitm.ac.in)